Proposed Changes to Hot Water and Water Heating Calculations in the 2008 California Building Energy Efficiency Standards

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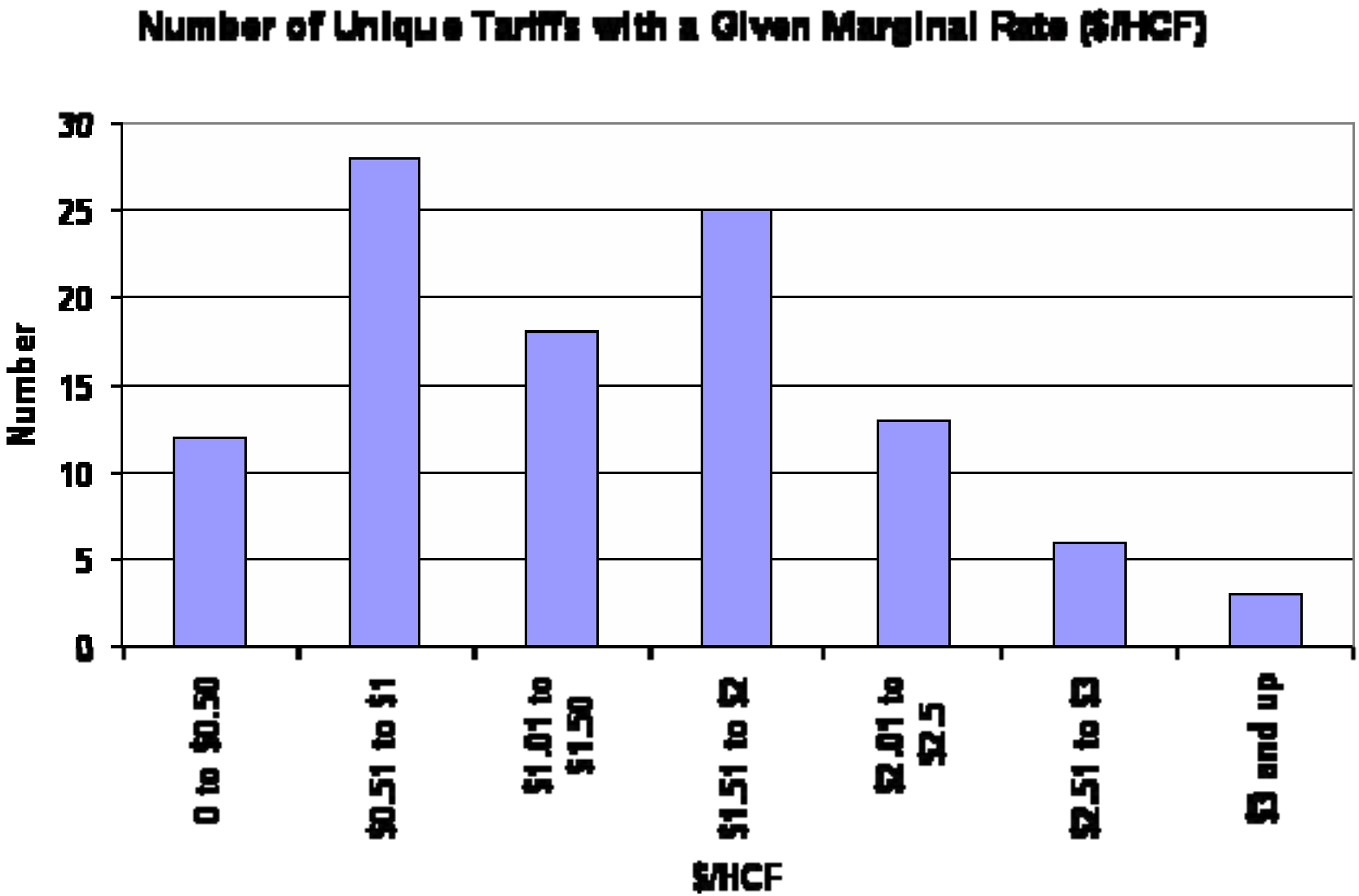
Water and Wastewater Tariffs

- change cost and benefit calculation for measures that reduce consumption of hot water
- savings in water and waste water bills to end user
- Recommendation:
  - $2 per HCF (100 cubic feet) savings

Water and Wastewater Tariffs: Methodology

- high growth areas
- number of new single family homes and units of multi-family housing
  - built in 2004
  - Construction Industry Research Board
- websites and telephone calls
- water tariffs for 74 cities or counties
  - (64% of all new housing)
- waste water tariffs for 65 cities or counties
  - (57% of all new housing)

Water Tariffs: Results



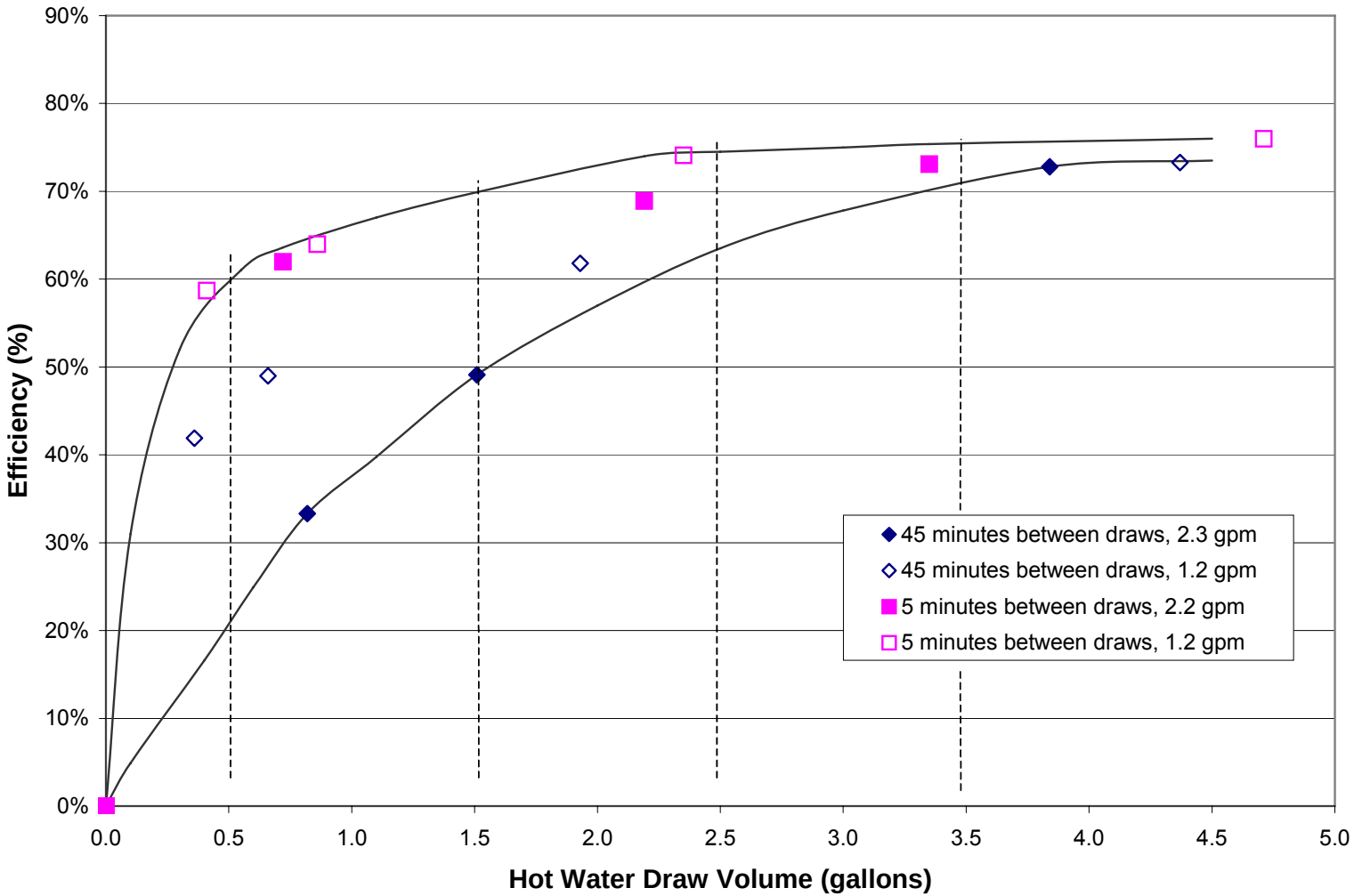
Tankless Gas Water Heaters

- change EF of tankless gas water heaters
- multiply listed EF by 0.912

Tankless Gas Water Heaters

- Current ACM overvalues performance
  - small hot water draws
  - heat exchanger “cool down”

Tankless Gas Water Heaters
Efficiency by Draw Volume



Distribution System Multipliers

- Changes
  - Parallel pipe
  - demand controlled recirculation
  - pipes buried in soil w & w/o insulation
  - all rounded to the nearest tenth.

Distribution System Multipliers

Measure	~~**DSM Current**~~	**DSM Proposed**
Pipe Insulation [all lines] (PIA)	~~0.9~~	0.9
Piping System Buried in Soil (PS)	~~------~~	3.8
Piping System Buried in Soil with Insulation (PSI)	~~------~~	1.0
Point of Use (POU)	~~0.00~~	0.0
Standard Case (STD)		
[Pipe Insulation Kitchen Lines = 3/4 inches]	~~1.00~~	1.0
Standard Pipes with no Insulation (SNI)	~~1.19~~	1.2
Parallel Piping (PP)	~~1.04~~	1.0
Recirculation, no control (RNC)	~~4.52~~	4.5
Recirculation + Timer Control (RTm)	~~3.03~~	3.0
Recirculation + Temperature Control (RTmp)	~~3.73~~	3.7
Recirculation + timer/temperature (RTmTmp)	~~2.49~~	2.5
Recirculation + Demand Control (RDmd)	~~1.31~~	1.0

Eligibility Requirements

- Insulation
  - recirculating sections
  - all in-soil hot water piping
  - to kitchen sink and dish washer (regardless of pipe size)
  - avoid future shrinkage.
    - compressed along its length
    - sealed from one length to the next
    - elbows shall be insulated, taped, and sealed to adjacent pipe sections.

Eligibility Requirements

- Demand recirculation systems
  - push buttons only
  - not occupancy sensors
  - push buttons must be located in
    - kitchen
    - master bathroom
    - all additional full bathrooms

Parallel Piping Hot Water Distribution Systems

- mandatory changes installation requirements
- water heater to manifold piping
  - distance ≤ ten feet
  - minimum R-4 pipe insulation